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RETARDATION, ACCELERATION, AND CLASS STANDING

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During the past decade, retardation, acceleration, and elimination have been in the forefront of discussion as important social and educational problems. Compulsory school laws have brought into the school system hosts of children of widely varying ability and maturity. This legislation and the growing consciousness of social responsibility for education, of which it is an evidence, have resulted in extensive provisions for defective and backward children, on the one hand, and in an influx of pupils who might otherwise not be in the system, on the other. These conditions have enormously complicated the problem of internal organization and adaptation of schools and curricula to the so-called normal child. Genetic psychology and child-study, the study of individual differences, and the practical experience of teachers have all shown that the concept of the normal child is a rather useless fiction. Pupils of the same age are strung out all along a vertical scale of maturity, on the one hand, and are distributed perhaps quite as widely on a horizontal scale of ability, on the other. Recent publications in popular journals of cases of unusual precocity have called attention afresh to this variability in rate of mental development. These cases have been wrongly interpreted as evidence of the inefficiency of the school system rather than as cases of unusually rapid maturity which the laws of variability would lead us to expect on rare occasions. If there is this variability, then chronological age is not an adequate index of mental or pedagogical age, and age-retardation statistics will give no satisfactory evidence of mental or pedagogical retardation. To furnish some data on this point and to indicate a method of inquiry which seems fruitful is the purpose of this paper.

Retardation is an ambiguous term that has come to be applied

to three very different things: (1) Retardation is used, e.g., by Witmer, to mean slow or arrested mental development. The retarded child is one the functions of whose brain are not developed up to the normal limit for his age. (2) Retardation refers merely to age-in-grade. The retarded child is one who is over-age, or behind the grade for his age, regardless of whether it is due to late entrance, absences from school, slow mental development, or lack of ability. (3) Retardation relates solely to the progress of the child in school. The retarded pupil is one who makes slow progress, the repeater, who takes more than the normal time to complete a prescribed course. The relation between these different conceptions of what retardation means has not been satisfactorily worked out and the reader of the already voluminous literature finds it hopelessly confusing.

Most of the numerous statistical investigations by Thorndike, Ayres, Strayer, Falkner, Lurton, etc., have been concerned with age-retardation, the determination of the percentage of pupils over-age, under-age, and of normal age in the various grades. In some of the studies there is an apparent assumption that age-retardation is indicative of mental retardation, that the retarded or over-age pupil is also a backward or a maladjusted pupil. Ayres, e.g., says: "The child of nine acts and thinks differently from the child of seven. Put the two in the same class and the work of the teacher is increased. The amount of attention which can be given to each is diminished, and the effect of the teaching is therefore lessened. No one can doubt that it would be a very great advantage if children could be so classified that the classes would be more homogeneous with respect to age." This assumption that growth in maturity is closely correlated with age is unwarranted. The child of nine may be mentally a child of seven or one of eleven. It may well be that the age-retarded pupil who is only a year or two over-age is classified with the group where he can work to the best advantage. If so, then retardation is not the serious evil it has been claimed to be. The good of the school and the good of society may best be served by having the child of nine years classed with children of seven or of eleven. Homogeneity in classes is of course

greatly to be desired but it is not necessarily accomplished by placing children of like chronological age together, but by placing together children of like mental age. Classification by size would probably be as useful for purposes of securing homogeneity as classification by chronological age.

The real problem of retardation is thus psychological rather than administrative and economic. What is needed for purposes of gradation of pupils is some measure of mental maturity, such as, for example, the much-discussed Binet scale of intelligence, which will enable us to determine mental age more accurately. Such tests are being applied in various sections of the country and the results will be awaited with interest.

In the meantime, it seemed worth while to study the school records of retarded, normal, and accelerated pupils to determine what qualitative differences are shown by each of the groups in school work measured by the schools' own standards of capacity and attainment. It is only by such a study that the real significance of retardation can be discovered. From the pedagogical and psychological points of view the important problem is whether there is actually such maladaptation as the age statistics suggest and whether age-retardation is correlated in any way with mental retardation. The specific questions raised were: What are the class standings of the retarded, accelerated, and normal pupils? Are the standings of the retarded pupils lower than those of the normal pupils? How are the standings distributed among the different kinds of retarded, normal, and accelerated pupils? Is there any alteration in the distributions up the age-scale?

Data on the amount of retardation and acceleration were obtained for 2,023 pupils in elementary schools of Madison through the kindness and co-operation of Superintendent Dudgeon. For assistance in the collection and tabulation of the data I am indebted to Mr. J. A. Stevenson, of Chicago, Illinois, and Mr. B. F. Adams, of Cambria, Wisconsin.

Table I gives the distribution of the children through the grades, the number accelerated, the number retarded, and the number of normal age.

TABLE I

	1	2	3	4	5	6	7	8	Total
Total number.....	286	315	326	275	225	226	206	164	2,023
Normal.....	178	157	160	112	79	93	75	66	920
Retarded.....	48	99	111	138	112	90	86	77	761
Accelerated.....	60	59	55	25	34	43	45	21	342

Table II gives the distribution in percentages.

TABLE II

	1	2	3	4	5	6	7	8	Total
Normal.....	62.2	49.8	49.1	40.7	35.1	41.1	36.4	40.2	45.5
Retarded.....	16.8	31.4	34.0	50.2	49.8	39.9	41.7	47.0	37.6
Accelerated.....	21.0	18.8	16.9	9.1	15.1	19.0	21.9	12.8	16.9

The age-standard for each grade has occasioned much controversy. Ayres¹ considers a pupil of normal age if, in the first grade, he is under eight years, in the second grade, under nine, etc. The Ayres standard thus allows an extra year for each grade. Its effect may be to conceal one year of retardation or repetition. On this standard, as applied to schools of the Middle West, it would be possible for every pupil in the system to enter at six years, the most frequent entering-age, to repeat a year, and still not be retarded according to the age statistics.

Lurton² in a study of retardation statistics from smaller Minnesota towns notes this point. He says that in every system covered by his investigation the children are admitted at six years of age or younger. He therefore reckoned the entering-age at six. Further, in every one of the schools studied, promotions are made once a year, in June. Each grade, by definition, means a year's work. Therefore, the child who enters the first grade at six should enter the second grade at seven, the third grade at eight, and so on. From the administrative point of view, the child who enters at seven is behind the prescribed schedule.

¹ L. P. Ayres, *Laggards in Our Schools*.

² F. P. Lurton, "A Study of Retardation in the Schools of Minnesota," *Science*, N.S., XXXIV, No. 884, December 8, 1911.

This age-standard is practically the one employed in this study. The date of birth and the average of the marks assigned for the school year 1910-11 were obtained for all pupils from the school records. The pupils were then classified into three groups according to the following age-standard:

	Retarded	Normal	Accelerated
First grade. . .	If born before September 1, 1903	If born between September 1, 1903, and September 1, 1904	If born after September 1, 1904
Eighth grade. .	If born before September 1, 1896	If born between September 1, 1896, and September 1, 1897	If born after September 1, 1897

On this basis the amount of retardation in the Madison school system is much less than that reported by Lurton.¹ For fifty-five city systems in Minnesota with the same age-standard, so far as I can judge from his statement, he finds 58.9 per cent retarded, 34.2 per cent normal, and 7.1 per cent accelerated pupils. The corresponding figures here are 37.6 per cent, 45.5 per cent, and 16.9 per cent, showing less retardation and more acceleration. The legal entering-age in Minnesota is five years, with the further provision that school boards may exclude children under six years, while that of Wisconsin is four years, though the most frequent entering-age in both states is six years. This may in part account for the difference in the results.

Charts 1 and 2 give the median class standings and the distribution of these standings for the three groups of pupils by grades.

An inspection of the medians and of the distribution-curves shows very clearly that, while the median standings are highest for the accelerated pupils and lowest for the retarded, the differences are not great and the overlapping in the curves is so marked that the differences lose significance. The noteworthy thing is that the range of variability is in general quite as great for one group as for the other or for all the pupils of a grade. Age-retardation is no index of inferior mental ability nor is acceleration an index of superior ability. Greater homogeneity in these classes would not,

¹ *Ibid.*

CHART I.—The comparison of the distribution of the marks received by pupils who have progressed at the normal rate (N), are retarded (R), or advanced (A) with the median standings.

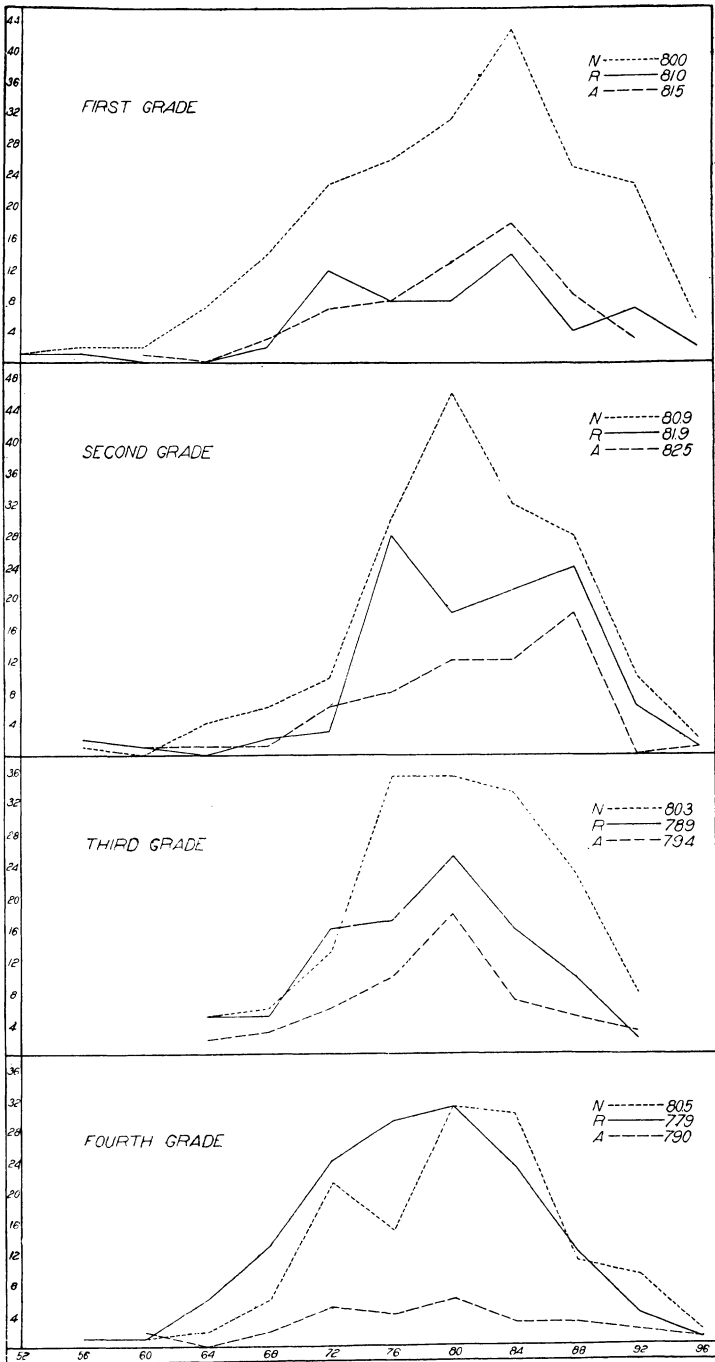
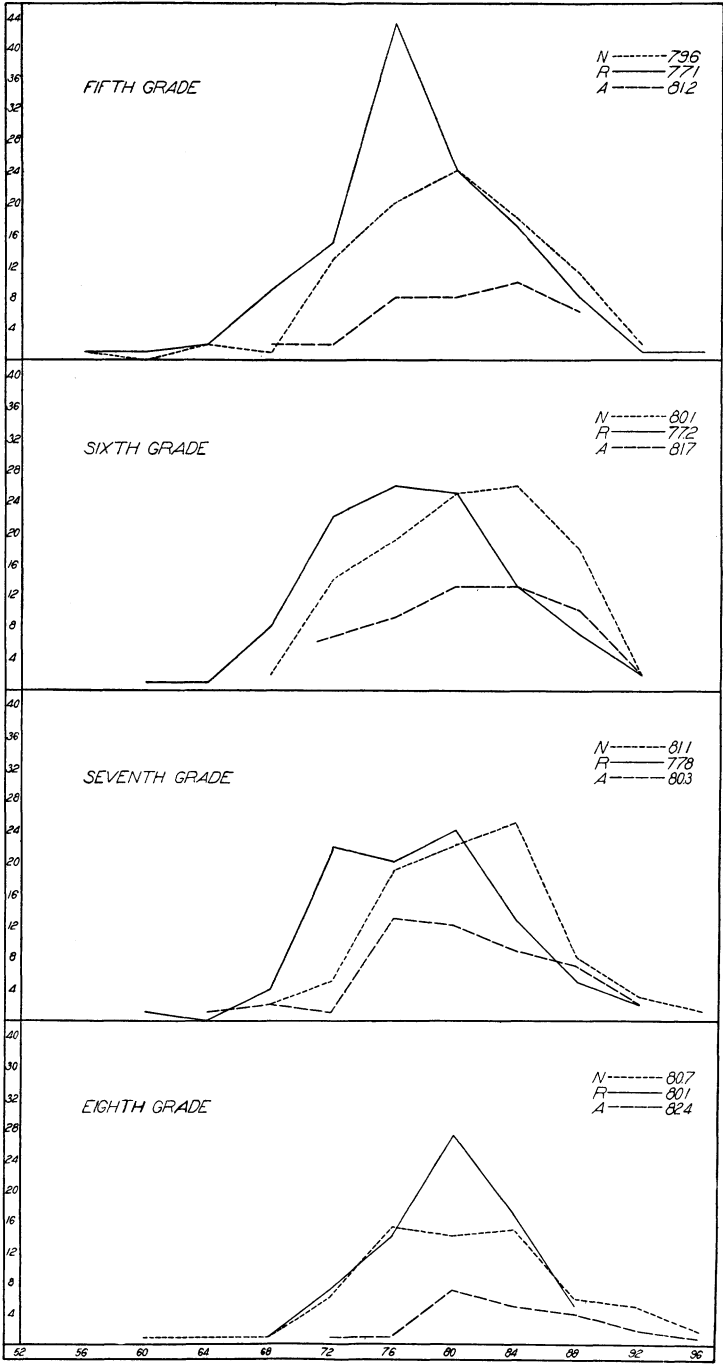


CHART I.—Continued



therefore, be secured on a basis of greater likeness in age-in-grade. Classification by similarity in ability or attainment, moreover, would include relatively about as many from one group as from either of the others, except in the sixth and seventh grades. There is a tendency to a sharper differentiation between the retarded and normal pupils beginning in the fifth grade and culminating in the seventh where the differences in the medians are considerable. Greater difficulty in work, greater rigor in the assignment of marks, and the accumulation of repeaters and over-age pupils who are but waiting to escape the operation of the compulsory school law account in large part for this fact.

The classification of pupils as retarded, normal, and accelerated, and a study of their average performances do not carry us very far. The retarded group may include (1) those who entered late but who may have made normal progress or even faster than normal progress; (2) those who entered at the normal age but who have been put back in change of schools, or who may have been kept out a year because of illness; (3) those who have repeated because of slow development or because of lack of ability, etc. Similarly, the normal group may include (1) those who entered at the normal age and progressed at the normal rate; (2) those who entered late one or more years and have gained one or more years; (3) those who entered early and repeated, etc. With a view to such detailed analysis of the performances of the different types of retarded, normal, and accelerated pupils, it was necessary to know the number of years the pupils had been in school. The school records unfortunately did not give this information and it could not be obtained until September, 1911. In the meantime, transfers, withdrawals, etc., reduced the number for whom complete data could be secured to 1,301 pupils from the first to the seventh grades, inclusive.

Table III gives the number of pupils and the average standings for all of the different types of retardation, normality, and acceleration.

The table is self-explanatory; a word only with reference to the effect of age of entrance on standings will make its meaning clear. There were in all 347 pupils of normal age and normal progress, i.e.,

a year for each grade, with an average standing of 79.7 per cent. It is particularly interesting to compare with this group those pupils who have made normal progress in school but who are over-age or retarded one or more years. There were 180 such pupils who entered a year late, or who dropped out for a year and then re-entered, with an average standing of 78.7 per cent; 47 pupils retarded two years, with an average standing of 78.6 per cent;

TABLE III

ACCELERATED			NORMAL AGE	RETARDED					
	2 Yrs.	1 Yr.		1 Yr.	2 Yrs.	3 Yrs.	4 Yrs.	5 Yrs.	6 Yrs.
Advanced 3 years.				2 79.5					
Advanced 2 years.		2 85.0	1 86.0	1 75.0					
Advanced 1 year.	1 87.0	14 81.9	23 79.2	14 82.0	3 78.3	3 77.7	2 83.0		1 69.0
Normal progress. .	13 81.4	142 78.9	347 79.7	180 78.7	47 78.6	13 78.7	5 75.8	2 79.0	1 60.0
Repeated 1 year.	5 78.4	18 80.0	83 78.5	130 78.6	67 77.5	41 76.8	16 77.8		
Repeated 2 years.		1 82.0	12 79.6	20 77.7	26 77.1	34 78.8	8 74.6	3 77.0	1 73.0
Repeated 3 years.				2 74.5	6 76.3	5 72.0	4 79.2		
Repeated 4 years.						1 81.0			
Repeated 5 years.									1 70.0

13 retarded three years, with an average standing of 78.7 per cent. In other words, the pupils who were one, two, or three years older, and hence, supposedly more mature, and who had been in school the normal number of years for their grade, do no better, but rather a little worse, than those of normal age. Similarly, the 142 pupils who entered a year early and progressed at the normal rate had an average standing of 78.9 per cent, a little less than the standing

of those of normal age and progress and identical with that of pupils retarded one, two, or three years. So far as one is able to judge from teachers' estimates of performance as indicated in assigned marks, and I know of no other method by which a better judgment can now be secured, the pupils are classified with considerable accuracy. One finds here in fact 750 pupils who have made normal progress distributed over a range of seven age groups (two pupils retarded five years and one retarded six years being disregarded), with substantially the same class standings for each age group.

TABLE IV

	No. of Pupils	Standings	P. E.
1. Accelerated and advanced.	17	82.6	± 1.3
2. Accelerated but normal progress.	155	79.2	± 0.4
3. Accelerated but repeated.	24	79.8	± 1.0
4. All accelerated.	196	79.5	± 0.35
5. Normal age but advanced.	24	79.5	± 1.0
6. Normal and normal progress.	347	79.7	± 0.25
7. Normal but repeated.	95	78.2	± 0.5
8. All normal age.	466	79.4	± 0.25
9. Retarded but advanced.	26	79.9	± 1.0
10. Retarded but normal progress.	248	78.6	± 0.35
11. Retarded and repeated.	365	77.7	± 0.25
12. All retarded.	639	78.1	± 0.2
13. Repeated 3 or more years.	19	75.5	± 1.2
14. Repeated 2 years.	105	77.9	± 0.5
15. Repeated 1 year.	360	78.2	± 0.25
16. All repeaters.	484	78.0	± 0.25
17. Normal progress.	750	79.8	± 0.20
18. Advanced 1 year.	61	80.3	± 0.65

The average standings of the various classes of pupils, which the classification by age and progress make it possible to analyze, together with an indication of the range within which the standings are statistically reliable, are shown in Table IV.

The noteworthy feature of the table is the slight difference in the average standings of the different classes of pupils. Aside from the first group, which includes the bright and precocious children (and their standings are not high enough to indicate serious mal-

adjustment), there are nine groups with substantially the same average standings. Exception should be made of group 7, the repeaters of normal age, but the difference, while significant, is not great. Such close agreement in standings was unexpected by the writer. It will be interesting to discover whether it prevails in other school systems as well. Objection can, of course, be made that statistical averages obscure the evils of bad classification, but such detailed analysis as is presented here should have shown any significant differences if they existed. At any rate, this inference from statistical averages is sounder than from individual cases of maladjustment.

The average performances of the retarded pupils are lower than those of the normal and accelerated pupils but the differences are again so slight as to be of little significance. Even the repeaters, on the average, attain marks but little below the normal except in the case of those who have repeated three or more years. School marks are notoriously unreliable but they are the best estimates we have of a pupil's ability to do the work of the school.

The general impression which the writer and his collaborators have obtained from the study of the average performances of the different types of pupils as well as from the individual marks is one of surprise, in view of current opinion, at the smallness and the character of the differences in scholarship. We should have expected the distribution-curve for the accelerated pupils to be skewed positively, and that of the retarded pupils to be skewed negatively. While such is the case, the differences in the character of the curves is not great. Even the repeaters who are supposed to be a drag upon a class keep approximately much closer to the average than is usually supposed.

A study of this character in a school system with three thousand or four thousand pupils in which careful records were kept of age, progress, and performance would permit a detailed analysis for the various classes of pupils in each grade. The number of cases in this investigation unfortunately does not make possible with sufficient reliability such a separate treatment by grades. If, in addition, separate marks were secured for ability, attainment, and effort or diligence, valuable information would be available. One pupil

of A ability may do B work because of C diligence or effort. Another may be of C ability, but do B work because of A diligence or conscientiousness. Teachers commonly estimate pupils in this way but make no separate records of such estimates. Marks assigned are often, if not usually, compounded from such judgments. So a pupil of C ability and C attainment may, and often is, given a mark of B because of his superior conscientiousness in work. The significance of school marks is therefore obscure. With complete records from a large school system we should obtain much better information than we now possess concerning the various classes of accelerated, normal, and retarded pupils, the significance of the entering-age, the relation of work in the kindergarten to progress in the elementary school, and the adjustment or maladjustment of the curriculum to the pupils.